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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/782,146

02/18/2004

David G. Van Steenkiste

FASC-10121

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12/05/2005

SCHMEISER OLSEN & WATTS

18 E UNIVERSITY DRIVE

SUITE # 101

MESA, AZ 85201

EXAMINER

VO, ANH T N

ART UNIT

PAPER NUMBER

2861

DATE MAILED: 12/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/782,146

Applicant(s)

VAN STEENKISTE, DAVID G.

Examiner

Anh T.N. Vo

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2/18/2004.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Information Disclosure Statement***

The references cited on PTO 1449 have been considered.

## **CLAIM REJECTIONS**

### ***Claim Rejections - 35 U.S.C. § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-20 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Mackay et al. (US Pat. 6,139,136) in view of Wheeler et al. (US Pat. 6,467,888) and Arway (US Pat. 4,067,020). and VanSteenkiste (6,281,916).

Note: The method steps are inherently taught in the apparatus device/limitations in the rejections as follow:

Mackay et al. disclose in Figures 1-2 an ink supply system comprising:

- an ink source (33);
- a first ink sub-reservoir (23) comprising:
  - \* a first top fluid surface at a first sub-reservoir fluid height;

- \* a first sub-reservoir ink inlet (49) fluidly connected to the ink source (33); and
- \* a first sub-reservoir outlet (21) and a second sub-reservoir outlet (19) that is above the first sub-reservoir outlet (21);
- a print head (5, 7, 9) comprising:
  - \* a first print head portion (9) fluidly connected to the first sub-reservoir outlet (21); and
  - \* a second print head portion (7) fluidly connected to the second sub-reservoir outlet (19) being above the first print head portion (9), whereby a first pressure at the first print head portion is substantially equal to a second pressure at the second print head portion (since a pressure source (73) pressurizes ink from the sub-reservoir (23) to the first and second head portions (9 and (7) so the portions (9) and (7) are received substantially the same pressure from the pressure source (73), see Figure 1);
- a first sensor (a sensor, column 7, line 48) connected to the actuator system (61), wherein the first sensor senses the first sub-reservoir fluid height, such that if the first sub-reservoir fluid height is below a first height range, the first sensor emits a signal to the actuator system, whereby the actuator system (61) actuates the pump system (41), allowing ink to flow from the ink source (33) to the first sub-reservoir ink inlet (49), and if the first sub-reservoir fluid height is above the first height range, the first sensor emits a signal to the actuator system, whereby the actuator system actuates the pump (41) system, preventing ink from flowing from the ink source to the first sub-reservoir ink inlet (Figure 1, column 7, lines 48-56);
- wherein the first sub-reservoir ink inlet (49) is located at an upper portion of the first sub-reservoir (23) (see Figure 1);
- the first sub-reservoir outlet (21) and the second sub-reservoir outlet (19) are located at a lower portion of the first sub-reservoir (23) (Figure 1);
- a pressure source (73) and wherein the first ink sub-reservoir (23) further comprises a first sub-reservoir pressure inlet (69) fluidly connected to the pressure source (73) (Figure 1).

However, Mackay et al. do not disclose a closed ink supply system wherein air is sealed outside the system and not allowed to flow into component system; and the ink source comprises a main reservoir, and wherein a fluid connection between the first sub-reservoir ink inlet and the

ink source comprises a gravity-fed conduit extending from the ink source to the first sub-reservoir ink inlet; a first valve system fluidly connected between the ink source and the first sub-reservoir ink inlet; an actuator system connected to the valve system; a first sensor connected to the actuator system, wherein the first sensor senses the first sub-reservoir fluid height, such that if the first sub-reservoir fluid height is below a first height range, the first sensor emits a signal to the actuator system, whereby the actuator system actuates the valve system, allowing ink to flow from the ink source to the first sub-reservoir ink inlet, and if the first sub-reservoir fluid height is above the first height range, the first sensor emits a signal to the actuator system, whereby the actuator system actuates the valve system, preventing ink from flowing from the ink source to the first sub-reservoir ink inlet; and wherein the actuator system comprises a first actuator connected to the first sensor, and wherein the valve system comprises a first valve connected to the first actuator; wherein the first ink sub-reservoir is adjustable in height; and a plurality of ink sub-reservoir connected between a main ink source and a print head.

Nevertheless, Wheeler et al. disclose in Figures 1A and 2-3 an ink jet printing system comprising:

- a closed ink supply system (6) wherein air is sealed outside the system and not allowed to flow into component system (Figure 2); and
- the ink source (6) comprises a main reservoir, and wherein a fluid connection (28) between the first sub-reservoir ink inlet (an unmarked tube is close by element 28a) and the ink source (6) comprises a gravity-fed conduit (unmarked conduit that contains an element 28b) extending from the ink source (6) to the first sub-reservoir ink inlet.

Furthermore, Arway discloses in Figure an ink supply system comprising:

- a first valve system (52) fluidly connected between the ink source (50) and the first sub-reservoir ink inlet (an unmarked ink let comes off from ink reservoir 10 that is connected to element 52);

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- an actuator system (level sensor 60 includes a control system for itself) connected to the valve system (52) (column 2, lines 63-66);
- a first sensor (level sensor 60 includes a sensor) connected to the actuator system, wherein the first sensor senses the first sub-reservoir fluid height, such that if the first sub-reservoir fluid height is below a first height range, the first sensor emits a signal to the actuator system, whereby the actuator system (60) actuates the valve system (52), allowing ink to flow from the ink source (50) to the first sub-reservoir ink inlet, and if the first sub-reservoir fluid height is above the first height range, the first sensor emits a signal to the actuator system, whereby the actuator system actuates the valve system, preventing ink from flowing from the ink source to the first sub-reservoir ink inlet (column 2, lines 63-68 and column 4, lines 1-34);
- wherein the actuator system comprises a first actuator connected to the first sensor, and wherein the valve system comprises a first valve connected to the first actuator (because level sensor 60 inherently comprises a sensor and a control system as shown in column 2, lines 63-66 and see Figure. Therefore they all are connected together); and
- wherein the first ink sub-reservoir is adjustable in height (column 3, lines 49-56).

VanSteenkister suggests in Figure 3 an ink supply system for an ink jet printer comprising a plurality of sub-reservoir (18, 20, 22, 24) connected between a main ink source (12) and a printhead (40) for producing extremely high quality images at very fast printing rates, see lines 12-15, column 1.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the teaching of Wheeler et al. and Arway in the ink supply system of Mackay et al. for the purpose of continuously supplying ink to the print head at a constant pressure, and employ more ink sub-reservoirs as suggested by VanSteenkiste in the ink supply system of Mackay et al for the purpose of producing extremely high quality images at very fast printing rates.


***Citation of Pertinent Prior Art***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art references (US Pat. 4,677,448; US Pat. 6,883,905) cited in the PTO 892 form show an ink supply system that is deemed to be relevant to the present invention. These references should be reviewed.

***CONCLUSION***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Anh Vo whose telephone number is (571) 272-2262. The examiner can normally be reached on Tuesday to Friday from 9:00 A.M. to 7:00 P.M..

The fax number of this Group 2861 is (571) 273-8300.



ANH T.M. VO  
PRIMARY EXAMINER  
December 1, 2005